

### ***Remarks***

Reconsideration of this Application is respectfully requested.

A Final Office Action ("Office Action") was issued on May 26, 2009 in response to the March 5, 2009 Amendment. Upon entry of the foregoing amendment, claims 2-11 and 17-28 are pending in the application, with claims 2-8 and 24 being independent claims. Claims 1 and 12-16 have been canceled without prejudice. Claims 2-11 and 17-20 have been amended to further define the invention and to correct informalities. Claims 21-28 have been newly added, with support for claims 21-28 found in paragraphs [0016], [0019], [0031], [0036], [0037], [0040], and [0045] of the originally filed specification. Descriptive support for the amended claims is found in the claims and the original specification as filed. The amendment introduces no new matter, and its entry is respectfully requested.

#### **I. Rejection of Claims 1-3 and 11-20 under 35 U.S.C. § 112**

In the May 26, 2009 Office Action, claims 1-2 were rejected under 35 U.S.C. § 112, first paragraph for allegedly failing to comply with the written description requirement. Applicant respectfully requests withdrawal of this rejection. Applicant has canceled claim 1 and amended claim 2 to remove the limitation "to greater than eighty percent of that which is experienced at standard sea level atmospheric pressure." The cancellation of claim 1 and the amendments made to claim 2 has rendered moot the rejection under 35 U.S.C. § 112, first paragraph. As a result, Applicant respectfully submits that independent claim 2 is now fully supported by the specification. Thus, Applicant respectfully requests withdrawal of the rejection under 35 U.S.C. § 112, first paragraph.

Claims 3 and 11-15 were also rejected under 35 U.S.C. § 112, first paragraph for allegedly failing to comply with the written description requirement. With respect to

independent claim 3 and dependent claims 11-15, Applicant respectfully notes that a “fire-susceptible, non-habitable region outside a fuel tank” is disclosed in one embodiment of the invention as a baggage compartment 43, for example. (Specification at Paragraph [0038].) Other areas may include, for example, “cabling ducts, baggage compartment, radio rack compartments, as well as other areas where electrical wiring and other high-fire-risk assemblies are concentrated.” (*Id.* at Paragraph [0018].) The baggage compartment may be a “non-habitable region outside the fuel tank” because it is “often inaccessible from the cabin during flight.” (*Id.* at Paragraph [0038].) The baggage compartment 43 may include an aft radio bay 49, where the nitrogen stored in the high-concentration nitrogen supply may be sent to “if a combustion situation is detected.” (*Id.* at Paragraph [0043].) As a result, Applicant respectfully submits that independent claim 3 and dependent claims 11-15 are fully supported by the specification. Thus, Applicant respectfully requests withdrawal of the rejection under 35 U.S.C. § 112, first paragraph.

II. Claims 2-5, 8-9, and 11-20 are allowable over Mitani

Claims 2-5, 8-9, and 11-20 were rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by U.S. Patent Publication No. 2002/0162915 (“Mitani”). For the following reasons, the rejection is respectfully traversed.

a. Independent Claim 2 is allowable over Mitani

Claim 2 recites “directing oxygen from the high-concentration oxygen supply overboard if a lower atmospheric oxygen concentration is required.” Support for this amendment is found in originally filed paragraph [0041] and [0045]. None of the cited prior art, alone or in

combination, discloses “directing oxygen from the high-concentration oxygen supply overboard if a lower atmospheric oxygen concentration is required” as claimed.

Mitani discloses discharging nitrogen out of the airplane. (Mitani at Paragraph [0020].) However, Mitani fails to show directing oxygen overboard for any reason. Instead, Mitani illustrates just the opposite by sending a portion of the oxygen stream along circulation line 15 into the cabin 2. (*Id.* at Figure 1.) The other portion of the oxygen stream is sent to evaporator 12 and then back into cabin 2. (*Id.*) Furthermore, Mitani fails to even discuss taking any action to create a lower oxygen concentration, for example, when a combustible situation is detected. As a result, Mitani does not disclose or even suggest “directing oxygen from the high-concentration oxygen supply overboard if a lower atmospheric oxygen concentration is required” as claimed.

None of the cited prior art, alone or in combination, disclose the recitations of independent claim 2. As a result, independent claim 2 is in condition for allowance and withdrawal of the rejection is respectfully requested.

b. Independent Claim 3 is allowable over Mitani

Claim 3 recites “dispensing nitrogen from the high-concentration nitrogen supply to a fire-susceptible, internal non-habitable region outside a fuel tank of the aircraft thereby decreasing the capability for the atmosphere therein to support combustion.” Claim 3 also recites “adding nitrogen from the high-concentration nitrogen supply into the habitable region to dilute the oxygen concentration if the reduced oxygen concentration is required.” Support for this amendment is found in originally filed paragraph [0045]. None of the cited prior art, alone or in combination, discloses “dispensing nitrogen from the high-concentration nitrogen supply to

a fire-susceptible, internal non-habitable region outside a fuel tank” or “adding nitrogen from the high-concentration nitrogen supply into the habitable region” as claimed.

Instead, Mitani discloses “a selectively permeable membrane 21” shown in Figure 1 adjacent to fuel tank 41 for separating air from the cabin into “air enriched with nitrogen ( $N_2$  rich) and air enriched with oxygen and vapor ( $O_2$ . $H_2O$  rich),” where the air enriched with nitrogen “is introduced into a fuel tank 41.” (Mitani at Paragraph [0020].) Once that is accomplished, the additional air enriched with nitrogen is then discharged out of the airplane. (*Id.*; see also Fig. 1.) Mitani does not disclose dispensing the nitrogen into a “fire-susceptible, internal non-habitable region outside the fuel tank,” but instead discloses expulsion of the nitrogen out of the airplane. (*Id.*) Furthermore, because Mitani expels the nitrogen out of the airplane, Mitani is incapable of allowing any “remixing of nitrogen,” as the nitrogen cannot enter into the habitable region of the aircraft in order to dilute the oxygen concentration of the habitable region. As a result, Mitani does not disclose “dispensing nitrogen from the high-concentration nitrogen supply to a fire-susceptible, internal non-habitable region outside a fuel tank” or “adding nitrogen from the high-concentration nitrogen supply into the habitable region” as claimed.

None of the cited prior art, alone or in combination, disclose the recitations of independent claim 3. As a result, independent claim 3 is in condition for allowance and withdrawal of the rejection is respectfully requested.

c. Independent Claim 4 is allowable over Mitani

Claim 4 recites “dispensing oxygen from the high-concentration oxygen supply under a control of the central control system into the occupant cabin based, at least in part, on the partial pressure of oxygen.” Support for this amendment is found in originally filed paragraphs [0041], [0044], and [0045]. None of the cited prior art, alone or in combination, discloses “dispensing

oxygen from the high-concentration oxygen supply under a control of the central control system into the occupant cabin based, at least in part, on the partial pressure of oxygen” as claimed.

In particular, Mitani does not disclose “dispensing oxygen from the high-concentration oxygen supply under a control of the central control system into the occupant cabin based, at least in part, on the partial pressure of oxygen.” Initially, Mitani fails to disclose any determination of a partial pressure of oxygen. Mitani fails to even suggest the use of any means that could be used to determine the partial pressure of oxygen. However, even if Mitani suggested some means to determine the partial pressure of oxygen, Mitani would still fail to disclose the recited claim limitation above.

Mitani fails to disclose any “central control system” that would provide control of the oxygen dispensed based on the partial pressure of oxygen. Instead, Mitani merely discloses that “oxygen alone out of the air drawn from the cabin 2 is supplied to the cabin 2 again. This makes it possible to maintain oxygen concentration at a level enough for passengers in the cabin 2 to spend comfortably even though an extracting amount of air for supplying fresh air is reduced by the maximum of 30 percent.” (Mitani at Paragraph [0021].) The above cited passage, as well as the rest of Mitani, fails to disclose any control of oxygen dispensing based on the partial pressure of oxygen in the occupant cabin. The only control Mitani discloses relates not to control of oxygen, but temperature control in the form of an air conditioning system operating when the aircraft is at a higher altitude and the aircraft surface has an elevated temperature. (*Id.* at Paragraph [0024].) As a result, Mitani fails to disclose “dispensing oxygen from the high-concentration oxygen supply under a control of the central control system into the occupant cabin based, at least in part, on the partial pressure of oxygen” as claimed.

None of the cited prior art, alone or in combination, disclose the recitations of independent claim 4. As a result, independent claim 4 is in condition for allowance and withdrawal of the rejection is respectfully requested.

d. Independent Claim 5 is allowable over Mitani

Claim 5 recites “varying the oxygen flow and the nitrogen flow based in part on a detected condition,” where the “nitrogen flow” is dispensed to an “occupant cabin” and the “oxygen flow” is dispensed to a “fire-susceptible, internal non-habitable region outside a fuel tank.” Support for this amendment is found in originally filed paragraphs [0041], [0044], and [0045]. None of the cited prior art, alone or in combination, discloses “varying the oxygen flow and the nitrogen flow based in part on a detected condition” as claimed.

Mitani does not disclose any device that varies an oxygen flow or a nitrogen flow. The Office Action alleges that Mitani paragraph [0024] discloses a reconfiguration of oxygen flow and nitrogen flow. (Office Action at 6.) This is incorrect. Mitani paragraph [0024] merely discloses that “[t]he air that is refrigerated by the heat exchanger 5 and the extracted air whose temperature is controlled by a temperature control valve 23 are mixed with by-passed [air] as shown by imaginary line in FIG. 1 and supplied to cabin 2.” (Mitani at Paragraph [0024].) Nothing in Mitani paragraph [0024] or any other portion of Mitani discloses any “varying the oxygen flow and the nitrogen flow.” In addition, Mitani fails to disclose any dispensing of the nitrogen flow to a “fire-susceptible, internal non-habitable region outside a fuel tank” because Mitani discloses the nitrogen to be “introduced into a fuel tank 41 as air enriched with nitrogen.” (*Id.* at Paragraph [0020].) As a result, Mitani does not disclose “varying the oxygen flow and the nitrogen flow based in part on a detected condition” as claimed.

Furthermore, Mitani does not inherently disclose the recited claim element. The Office Action alleges that Mitani discloses the recited claim element because “[i]n order to maintain oxygen concentration at a level enough for passengers in the cabin to spend time comfortably it is inherent that the environment control unit continuously detect absolute pressure and oxygen percentage in areas of the aircraft.” (Office Action at 3.) However, this inherency argument fails because Mitani does not disclose maintaining oxygen concentrations but rather only the control of air temperature. (Mitani at Paragraph [0024].) As stated above, M.P.E.P. § 2112 requires “objective evidence or cogent technical reasoning to support the conclusion of inherency.” (M.P.E.P. § 2112.) In this case, Applicant respectfully submits that control of the temperature or the comfort of the passengers in the cabin does not necessarily lead to any varying of the nitrogen flows and the oxygen flows based in part on a detected condition. As a result, Mitani does not inherently disclose “varying the oxygen flow and the nitrogen flow based in part on a detected condition” as claimed.

None of the cited prior art, alone or in combination, disclose the recitations of independent claim 5. As a result, independent claim 5 is in condition for allowance and withdrawal of the rejection is respectfully requested.

e. Independent Claim 8 is allowable over Mitani

Claim 8 recites “dispensing high-concentration nitrogen from the first location to a fire-susceptible, non-habitable internal region away from a fuel tank, thereby decreasing a capability for an atmosphere of the fire-susceptible, non-habitable internal region to support combustion by reducing a partial pressure of oxygen within the atmosphere.” Support for this amendment is found in originally filed paragraphs [0038] and [0043]. None of the cited prior art, alone or in combination, discloses “dispensing high-concentration nitrogen from the first location to a fire-

susceptible, non-habitable internal region away from a fuel tank, thereby decreasing a capability for an atmosphere of the fire-susceptible, non-habitable internal region to support combustion by reducing a partial pressure of oxygen within the atmosphere” as claimed.

Instead, Mitani discloses that nitrogen “is introduced into a fuel tank as air enriched with nitrogen and overflow air enriched with nitrogen is discharged [] out of the airplane.” (Mitani at Paragraph [0020] (emphasis added).) The nitrogen is stored within the fuel tank 41, and not in a region “away from a fuel tank” as recited in the claim. (*Id.* at Figure 1.) Nothing in Mitani discloses or even suggests that the nitrogen is away from the fuel tank. As a result, Mitani fails to disclose “dispensing high-concentration nitrogen from the first location to a fire-susceptible, non-habitable internal region away from a fuel tank, thereby decreasing a capability for an atmosphere of the fire-susceptible, non-habitable internal region to support combustion by reducing a partial pressure of oxygen within the atmosphere” as claimed.

None of the cited prior art, alone or in combination, disclose the recitations of independent claim 8. As a result, independent claim 8 is in condition for allowance and withdrawal of the rejection is respectfully requested.

f. Dependent Claims 11-21 are allowable over Mitani

Claims 11 and 17-21 are dependent on claims 3, 5, and 8. Because dependent claims necessarily include each and every element of a claim from which they depend, the Applicant respectfully submits that dependent claims 11 and 17-21 are also allowable as they depend from independent claims 3, 5, and 8. As a result, claims 11 and 17-21 are in condition for allowance and withdrawal of the rejection is respectfully requested.



III. Claims 6, 7, 10, and 22-23 are allowable over Mitani in view of Porlier

Claims 6, 7, and 10 were rejected under 35 U.S.C. § 103(a) as allegedly being anticipated by Mitani in view of U.S. Patent Number 4,282,870 ("Porlier"). For the following reasons, the rejection is respectfully traversed.

a. Independent Claim 6 is allowable over Mitani in view of Porlier

Claim 6 recites "introducing the nitrogen rich air stored in the unoccupied area into an occupied area." Claim 6 also recites "establishing a supply of nitrogen rich air by separating nitrogen from ambient air aboard the aircraft." Support for this amendment is found in originally filed paragraph [0044]. None of the cited prior art, alone or in combination, discloses "introducing the nitrogen rich air stored in the unoccupied area into an occupied area" as claimed.

The Examiner admits that Mitani fails to disclose "introducing the nitrogen rich air stored in the unoccupied area into an occupied area," but asserts that Porlier does. However, Porlier also fails to disclose "introducing the nitrogen rich air stored in an unoccupied area into the occupied area." Porlier fails to disclose any "nitrogen rich air" because Porlier fails to disclose "establishing a supply of nitrogen rich air by separating nitrogen from ambient air onboard the aircraft." The nitrogen obtained in Porlier comes from engine bleed air, instead of from ambient air aboard the aircraft. (Porlier at Col. 1:25-31.) In addition, the engine bleed air is never separated to produce "a supply of nitrogen rich air." (*Id.*) Without a supply of "nitrogen rich air," Porlier is incapable of "introducing the nitrogen rich air stored in the unoccupied area into an occupied area." As a result, Porlier does not disclose or even suggest "introducing the nitrogen rich air stored in the unoccupied area into an occupied area" as claimed.

None of the cited prior art, alone or in combination, disclose the recitations of independent claim 6. As a result, independent claim 6 is in condition for allowance and withdrawal of the rejection is respectfully requested.

b. Independent Claim 7 is allowable over Mitani in view of Porlier

Claim 7 recites “introducing the nitrogen rich air in the non-habitable area of the aircraft into the habitable area, in conjunction with directing the oxygen rich air overboard if a fire is detected onboard the aircraft.” Support for this amendment is found in originally filed paragraphs [0041] and [0044]. None of the cited prior art, alone or in combination, discloses “introducing the nitrogen rich air in the non-habitable area of the aircraft into the habitable area, in conjunction with directing the oxygen rich air overboard if a fire is detected onboard the aircraft” as claimed.

Mitani fails to disclose “introducing the nitrogen rich air stored in the non-habitable area of the aircraft into the habitable area, in conjunction with directing the oxygen rich air overboard” as claimed. For similar reasons stated above, Mitani fails to disclose the recited element of “introducing the nitrogen rich air” because Mitani discloses that the nitrogen is discharged out of the airplane rather than being sent into the habitable area. (Mitani at Paragraph [0020].) Also, for reasons similar to those stated above, Mitani fails to disclose “directing the oxygen rich air overboard” because Mitani illustrates that a portion of the oxygen stream is sent along circulation line 15 into the cabin 2. (*Id.* at Figure 1.) The other portion of the oxygen stream is sent to evaporator 12 and then back into cabin 2. (*Id.*) As a result, Mitani fails to disclose “introducing the nitrogen rich air stored in the non-habitable area of the aircraft into the habitable area, in conjunction with directing the oxygen rich air overboard if a fire is detected onboard the aircraft” as claimed.

Porlier fails to disclose “introducing the nitrogen rich air stored in the non-habitable area of the aircraft into the habitable area, in conjunction with directing the oxygen rich air overboard if a fire is detected onboard the aircraft” as claimed. For reasons stated above, Porlier fails to disclose any “nitrogen rich air” because Porlier fails to disclose “establishing a supply of nitrogen rich air by separating nitrogen from ambient air onboard the aircraft” as the nitrogen obtained in Porlier comes from engine bleed air, instead from ambient air aboard the aircraft. (Porlier at Col. 1:25-31.) Without a supply of “nitrogen rich air,” Porlier is incapable of “introducing the nitrogen rich air stored in the unoccupied area into the occupied area.” As a result, Porlier does not disclose or even suggest “introducing the nitrogen rich air stored in the unoccupied area into the occupied area.” In addition, Porlier is silent with respect to any dumping of oxygen rich air overboard. The only method Porlier discloses to reduce oxygen content is to mix the oxygen with bleed air. (*Id.* at Col. 1:29-34.) Porlier also fails to disclose any separation of oxygen from ambient air, but instead discloses an oxygen generator with a sensing means “adapted to receive a portion of the breathing mixture” provided by the oxygen generator. (*Id.* at Col. 1:48-50.) As a result, Porlier fails to disclose “introducing the nitrogen rich air stored in the non-habitable area of the aircraft into the habitable area, in conjunction with directing the oxygen rich air overboard if a fire is detected onboard the aircraft” as claimed.

None of the cited prior art, alone or in combination, disclose the recitations of independent claim 7. As a result, independent claim 7 is in condition for allowance and withdrawal of the rejection is respectfully requested.

c. Dependent Claims 10 and 22-23 allowable over Mitani in view of Porlier

Claim 10 and 22-23 are dependent on claim 8. Because dependent claims necessarily include each and every element of a claim from which they depend, Applicant respectfully

submits that dependent claims 10 and 22-23 are also allowable as they depend from independent claim 8. As a result, claims 10 and 22-23 are in condition for allowance and withdrawal of the rejection is respectfully requested.

IV. Claims 24-28 are allowable over the cited prior art

Claims 24-28 are newly added. In addition, claims 24-28 are allowable as being patentable over the cited prior art.

a. Independent Claim 24 is allowable

Claim 24 recites “a central control unit controlling a dispensation of the nitrogen rich flow and the oxygen rich flow based in part on an output of the plurality of sensors.” None of the cited prior art, alone or in combination, discloses “a central control unit controlling a dispensation of the nitrogen rich flow and the oxygen rich flow based in part on an output of the plurality of sensors” as claimed.

Mitani fails to disclose a “central control unit” as claimed. Instead, Mitani merely discloses that “oxygen alone out of the air drawn from the cabin 2 is supplied to the cabin 2 again. This makes it possible to maintain oxygen concentration at a level enough for passengers in the cabin 2 to spend comfortably even though an extracting amount of air for supplying fresh air is reduced by the maximum of 30 percent.” (Mitani at Paragraph [0021].) The above cited passage, as well as the rest of Mitani, fails to disclose any control of oxygen dispensing based on the partial pressure of oxygen in the occupant cabin. The only control Mitani discloses relates not to control of oxygen, but temperature control in the form of an air conditioning system operating when the aircraft is at a higher altitude and the aircraft surface has an elevated temperature. (*Id.* at Paragraph [0024].) As a result, Mitani fails to disclose “a central control

unit controlling a dispensation of the nitrogen rich flow and the oxygen rich flow based in part on an output of the plurality of sensors” as claimed.

None of the cited prior art, alone or in combination, disclose the recitations of independent claim 24. As a result, independent claim 24 is in condition for allowance and withdrawal of the rejection is respectfully requested.

b. Dependent Claims 25-28 allowable over the cited prior art

Claim 25-28 are dependent on claim 24. Because dependent claims necessarily include each and every element of a claim from which they depend, Applicant respectfully submits that dependent claims 25-28 are also allowable as they depend from independent claim 24. As a result, claims 25-28 are in condition for allowance.

### ***Conclusion***

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,

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